

Product	Organization	Features	Technology	Platform/Software	Resolution	Price	URL
Internal Government Solar Modeling Efforts							
Concentrating Solar Deployment System (CSDS)	NREL	<ul style="list-style-type: none"> - Computer model that looks at generating and transmission capacity of concentrating solar - According to NREL "minimizes system-wide costs of meeting loads, reserve requirements, and emission constraints by building and operating new generators and transmission in each of 26 two-year periods from 2000 to 2050. CSDS is focused on addressing the market issues of greatest significance to renewables — specifically issues of transmission and resource variability." 	See description provided in the URL	See description provided in the URL	US electric sector - national scale	N/A	http://www.nrel.gov/analysis/analysis_tools_cross.html
Solar Deployment System (SolarDS)	NREL	<ul style="list-style-type: none"> - According to NREL, a model that "evaluates the potential market penetration of solar photovoltaic (PV) technology" - "SolarDS examines the market competitiveness of Solar PV technologies from the building user's perspective, considering capital costs, electricity prices, as utility rate structures, incentives, and net-metering policies." And can "derive a national estimate of the potential PV market from 2005 to 2050." 	See description provided in the URL	Spreadsheet/VBA-based model	216 locations in the US	N/A	http://www.nrel.gov/analysis/analysis_tools_tech_sol.htm
Subdivision Energy Analysis Tool (SEAT)	NREL and the California Energy Commission (CEC)	<ul style="list-style-type: none"> - This tool will "facilitate the design of more solar-optimized neighborhoods." - "The use can optimize solar access by providing feedback on energy impacts (e.g., building heating, building cooling, solar water heating, photovoltaics, total time-dependent-valuation-weighted energy) as the user develops or modifies street layout designs." 	Proprietary Software (still under development)		Subdivision	N/A	http://www.energy.ca.gov/research/seat/index.html
On-Line Solar Estimation Applications: Both Free and for a Fee							
Wattbot	Wattbot	<ul style="list-style-type: none"> - A tool for consumers to enter information about existing patterns of energy use, and recommend a number of different ways to reduce that energy usage - This product will help consumers connect with local providers that can help with a PV solar installation bid, for example - On-line forum feature for discussion 	Custom online web calculator	Internet Browser	US – street level	Free – you must create a user account	http://www.wattbot.com/
My Solar Estimator	findsolar.com	<ul style="list-style-type: none"> - The user chooses the state and County and get an estimate of kWh/m²/day - To determine energy savings, the user can pick the utility company and enter in electricity usage. It will report system costs as well as savings and benefits, such as returns in investments and years to break even 	Custom online web calculator	Internet Browser	<ul style="list-style-type: none"> - County level for PV estimate - Utility specific for cost savings 	Free	http://www.findsolar.com/index.php?page=rightforme
In My Backyard (IMBY)	National Renewable Energy Laboratory (NREL)	<ul style="list-style-type: none"> - This interactive product allows a user to zoom into an address and physically draw the outline of an area of where to install hypothetical PV solar panels (or a wind turbine) - It shows the amount of electricity that can be generated at that location along with the options to calculate residential usage. If the user has more specific site information, it can be entered for a better estimation. 	<ul style="list-style-type: none"> - Google maps with a custom interface - Uses PVWATTS for a fixed-tilt array estimation 	Internet Browser	Estimates PV solar for individual households in the continental US, Hawaii and northern Mexico	Free	http://www.nrel.gov/eis/imby/
PVWATTS	NREL	<p>Two versions:</p> <ul style="list-style-type: none"> - Version 1 – GIS web server that allows user to pick a state, then a city. System specifications are made and then solar radiation, AC energy and energy values are presented on a monthly basis - Version 2 – is grid-based, has more information, and has a better coverage of the US than version 1. It can be run as a standalone viewer, or through the US Solar Atlas. See URLs at right 	<ul style="list-style-type: none"> - Version 1 can be viewed with an internet browser - Version 2 is built on the ArcIMS platform and should work in most browsers. It can also be viewed in the US Solar Atlas, which is also on the ArcIMS platform 	Internet Browser	Global scale, 1 to 10 km grid cells	Free	http://rredc.nrel.gov/solar/codes_algs/PVWATTS/ Version 1: http://rredc.nrel.gov/solar/codes_algs/PVWATTS/version1 Version 2: http://mapserve2.nrel.gov/website/PVWATTS/SLITE/viewer.htm US Solar Atlas: http://mapserve2.nrel.gov/website/L48NEWPVWATTS/viewer.htm
National Solar Radiation Database Daily Statistics Files	NREL	<ul style="list-style-type: none"> - 30-year Average and standard deviation of the daily total solar energy (direct normal, diffuse horizontal, and global horizontal) for specific stations from 1961 - 1990 - A user picks a specific region, then a specific city within that region. A tab-delimited html file of statistics is presented - See the User Manual URL for how to interpret the data 	Database	Internet Browser	Specific US Cities	Free	http://rredc.nrel.gov/solar/old_data/nsrdb/dsl/ User Manual: http://rredc.nrel.gov/solar/pubs/NSRDB/
SWERA IMS	Solar and Wind Energy Resources Assessment	<ul style="list-style-type: none"> - On-line tool for viewing renewable resource data, primarily solar and wind 	Internet Map Server	Internet Browser	Global scale, 1 to 10km grid cells	Free	http://swera.unep.net/index.php?id=7 Web Map: http://na.unep.net/swera_ims/map/

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RoofRay	RoofRay	<ul style="list-style-type: none"> - This tool allows a user to pinpoint their address and then draw multiple shapes, and specify the downslope direction. These inputs are used to estimate the amount of PV solar that can be generated at that location. - It can look at system performance based on geographic location and local utility information. It also offers a tool to get a quote from a solar installer. 	Custom online web calculator	Internet Browser	US – street level	Free - you must create a user account	http://www.roofray.com/
Solar Power Incentive Map Solar Calculator Solar Power Rating	Cooler Planet	<ul style="list-style-type: none"> - A suite of tools that allows a user to quickly size a solar PV system and see what incentives are available at that location. You provide the address, monthly electric bill, and desired offset of those costs and the output shows what size system you will need in terms of square footage, cost, break even time horizon and emissions results - The solar power rating compares each state's incentives based on metrics developed by Cooler planet 	Custom online web calculator	Internet Browser	US – street level	Free	http://solar.coolerplanet.com/Default.aspx
Renewable Energy on Contaminated Land and Mining Sites	Environmental Protection Agency (EPA)	<ul style="list-style-type: none"> - An on-line map that shows the point location of 5 EPA tracked contaminated sites and their potential for re-development for renewable sources of energy, including an assessment of the "best" renewable energy potential at that site for solar, wind and biopower 	Google Earth	Google Earth .kmz file	US - point specific locations of EPA tracked contaminated sites	Free - Requires installation of Google Earth	http://www.epa.gov/renewableenergyland/
FirstLook	3Tier Group	<ul style="list-style-type: none"> - FirstLook mapping product provides solar mapping and due diligence information - The viewer allows a user to pick from three types of radiation 1) Direct Normal 2) Global Horizontal and 3) Diffuse <p>You type in a lat/long or physical address and click the location on the map for an estimate in kWh/m² per day or W/m² per day (requires login, which is free)</p>	Google Maps	Internet Browser	<ul style="list-style-type: none"> - North, Central and South America - Location can be found by address or latitude/longitude 	<ul style="list-style-type: none"> - Free portion requires an account - More detailed assessments are provided at a cost 	http://www.3tierrgroup.com/ Application is available at: http://firstlook.3tierrgroup.com/
Solar Automated Feature Extraction (SAFE)	CH2MHill	<ul style="list-style-type: none"> - CH2mHill has helped create an interactive solar map of San Francisco and Sacramento that shows locations of currently installed systems and solar potential for any address within the two cities that includes: - PV potential, Electricity use cost reduction, CO2 and greenhouse gas reduction, PV installer information, and photographs. 	Google Maps	Internet Browser	Street level for both San Francisco and Sacramento	<ul style="list-style-type: none"> - Free viewing of solar potential and other information in each city - Interested cities can contact CH2MHill for pricing to develop their own solar maps 	Main CH2mHILL solar webpage: http://www.ch2m.com/corporate/markets/enterprise_management_solutions/solar_mapping_capabilities/default.asp pdf explaining SAFE: http://www.ch2m.com/corporate/markets/enterprise_management_solutions/solar_mapping_capabilities/assets/Solar_mapping_project_sheet_rev2.pdf San Francisco Solar Map Portal: http://www.sf.solarmap.org/ Sacramento Solar Map Portal (SMUD): http://smud.solarmap.org/map.html
Clean Power Estimator	Clean Power Research Software	<ul style="list-style-type: none"> - Provides software and web-based tools to "evaluate the economics of clean energy investments" - This software can be regionally customized to analyze costs and potential savings for PV solar installation 	Proprietary Software	Internet Browser	US	<ul style="list-style-type: none"> - Free viewing of solar potential and other information in specific cities - Interested cities can contact the company for pricing to develop customized solar estimating tools 	http://www.clean-power.com/software.htm Example of Clean Power Estimator for California: http://www.consumerenergycenter.org/renewables/estimator/index.html Example of Clean Power Estimator for New York: http://nyserdaweb.cleanpowerestimator.com/nyserdaweb.htm
Free Downloadable Spreadsheets, Programs and Maps for Calculating Solar Potential and Costs/Benefit Analysis							
HOMER	NREL	<ul style="list-style-type: none"> - Evaluates design options for both off-grid and grid-connected power systems. Optimization and sensitivity analysis for determining economic and technical feasibility of options 	Free software, requires registration	Microsoft Windows	Buildings, facilities, power grids in the US	Free for 6 months with unlimited renewal options	https://analysis.nrel.gov/homer/ Limited Web Application of Homer: http://www.fullspectrumenergy.com/default.asp
Village Power Optimization Model for Renewables	NREL	<ul style="list-style-type: none"> - According to NREL, and "Optimization model for designing village electrification systems. Given a map of a village and some information about load sizes and equipment costs, VIPOR decides which houses should be powered by isolated power systems.... And which should be included in a centralized distribution grid" 	Free software, requires registration	Microsoft Windows	Spatially distributed grid cells defined by the user. Geared for islands or isolated villages	Free for 6 months with unlimited renewal options	http://analysis.nrel.gov/vipor/
Bird Clear Sky Model	NREL	<ul style="list-style-type: none"> - According to NREL, the model uses a "broadband algorithm which produces estimates of clear sky direct beam, hemispherical diffuse, and total hemispherical solar radiation on a horizontal surface" 	Spreadsheet	Excel Spreadsheet	See model documentation	Free	http://rredc.nrel.gov/solar/models/clearsky/
PV Value Clearinghouse	NREL	<ul style="list-style-type: none"> - According to NREL, "A searchable database of analyses of distributed power applications with an emphasis on distributed power technology benefits and costs. This information will be helpful for anyone looking for analysis methodologies and results of solar power cost/benefit analyses" 	Database	Internet Browser - Online database	Depends on data being accessed	Free	http://www.nrel.gov/analysis/pvclearinghouse/
Jobs and Economic Development Impact (JEDI)	NREL	<ul style="list-style-type: none"> - A model that can analyze the job and economic impacts of concentrating solar power 	Spreadsheet	Excel Spreadsheet	Power generation at the local and state level	Free	http://www.nrel.gov/analysis/jedi/
Static and Dynamic Maps/GIS data	NREL	<ul style="list-style-type: none"> - United States Solar Atlas (dynamic) - PV solar radiation (static) - Direct normal solar radiation (static) 	Static maps and digital files produced using GIS software	.jpeg images and .shp shapefiles	Approximately 40km x 40km	Free	http://www.nrel.gov/gis/temp.html#pv http://www.nrel.gov/gis/solar.html

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Solar Advisor Model (SAM)	NREL / SNL / DOE	- According to model documentation, "The Solar Advisor Model is able to evaluate several types of financing (from residential to utility-scale) and a variety of technology-specific cost models for several and, eventually, all SETP technologies. The SETP technologies currently represented in SAM include concentrating solar power (CSP) parabolic trough systems and photovoltaic (PV) flat plate and concentrating technologies. Other technologies to be added include dish/Stirling, power towers, and solar heating (primarily solar residential hot water)"	Proprietary software with free access	Windows 2000 or XP	Residential to utility scale	Free - requires set up of a user account	https://www.nrel.gov/analysis/sam/
Hybrid Power System Simulation Model (Hybrid2)	NREL and the Renewable Energy Research Laboratory (RERL)	- Designed to evaluate performance and economics of hybrid electrical power systems that consist of more than one power generating source for small to large communities - This software is similar to HOMER although it does not include optimization	Proprietary software with free access	Microsoft Windows	Individual to large scale community systems	Free - requires set up of a user account	http://www.ceere.org/rerl/rerl_hybridpower.html
RETScreen 4	RETScreen International (Natural Resources Canada)	- Decision support tool to evaluate energy production, savings, emissions, and life-cycle costs	Spreadsheet	Excel Spreadsheet	International with country and state specific climate station data	Free - requires set up of a user account	http://www.retscreen.net/ang/centre.php
SolarSizer	Solar OnLine / NASA	- According to Solar OnLine SolarSizer is a, "Professional tool for designing and sizing photovoltaic systems. It uses a graphic interface to simplify the process of choosing components and making cost and energy calculations. This interface allows novices or experts to use SolarSizer as a PV design tool or as an educational program"	Proprietary Software with free access	Microsoft Windows	System level	Free demo version	http://www.solenergy.org/html/about/SolarSizer.html
Commercial Software and Tools for Solar Potential and Cost/Benefit Analysis							
PV - Design Pro	Maui Solar Energy Software Corporation	- Solar fraction charts by month, battery states of charge by month, annual performance table, cash-flows of purchased and sold energy, system costs, costs of backup energy, and much more	Proprietary software	At least Microsoft Windows 2000		Contact company for pricing	Overview at: http://www.eere.energy.gov/buildings/tools_directory/software.cfm/ID=96&pagename=alpha_list Software at: http://www.maui-solarsoftware.com/
OnGrid Solar Financial Analysis Tool	OnGrid Solar	- This tool is geared for PV solar installers and dealers - It can help size A PV solar system, show costs and perform financial analysis	Proprietary software	Excel Spreadsheet	US: Certain state's electric rate schedules and incentives are available	- Free trial download - Contact company for pricing	http://www.ongrid.net/
Pvoptimize	KG Associates, LLC	- Tool geared towards solar PV installers and estimators in California. Specific California Solar Initiative rebate information is provided	Proprietary software	Microsoft Windows	California	- Free trial download - Contact company for pricing	http://www.pvoptimize.com/index.html
PV Sol 3.0 T Sol	The Solar Design Company	- A program that can help calculate the size of a grid connected or off-grid solar power system - The software can calculate thin film modules as well - The software has average climate variables for 2000 international locations - T Sol helps design a solar thermal system	Proprietary software	Microsoft Windows	International	Contact company for pricing	http://www.solardesign.co.uk/pvsol.htm
PV F-Chart	F-Chart Software	- Comprehensive PV system analysis and design program - the software can look at utility interface, battery storage or stand-alone systems	Proprietary software	Microsoft Windows	International	Contact company for pricing	http://www.fchart.com/pvfchart/pvfchart.shtml
PVSYST 4.33	University of Geneva	- A program that can model grid connected, stand alone, pumping or DC grid connected PV systems - This software product has a large component database and allows the user to import many different meteorological data sources	Proprietary software	Microsoft Windows	International	Contact company for pricing	http://www.pvsyst.com/
Renewable Energy Scorecard	Honeywell	- According to Forbes " A computer program that can calculate the most economically feasible type of renewable energy for a customer in a particular geographic region" - Evaluates between solar, wind and biomass	Proprietary software	Spreadsheet	Any location in the US and Canada	Contact company for pricing	https://buildingsolutions.honeywell.com/NR/rdonlyres/BA49B82D-6D2D-4CD1-944C-2CC6F02EEAE0/116793/ba49b82d6d2d4cd1944c2cc6f02eeae0.pdf? Forbes article on their services: http://www.forbes.com/2008/06/18/honeywell-renewable-resources-tech-sciences-cx_stc_0618honeywell.html
INFORMS Decision Support Framework	USDA Forest Service	- Calculates direct, diffuse, global radiation, direct radiation duration, sunmaps, sky maps and viewsheds - Required inputs include digital elevation map (DEM), atmospheric Transmissivity and diffuse proportion	- A custom extension for use in ArcView 3.x - Utilizes raster based imagery	ArcView 3.x (no longer sold or supported)	Varies, depending on inputs	Free	http://www.fs.fed.us/informs/download.php An overview of the tool is available at: http://gis.esri.com/library/userconf/proc99/proceed/papers/pap867/p867.htm http://www.esri.com/
ArcGIS 9.3 Spatial Analyst – Solar Radiation Analysis toolbox	ESRI	- Calculates solar insolation across a landscape or for a specific location and is the updated version of the one available originally in ArcView 3.x	- A custom extension for use in ArcGIS 9.3 - Utilizes raster based imagery	ESRI ArcGIS 9.3 with the Spatial Analyst Extension	Varies, depending on inputs	Contact company for pricing	http://webhelp.esri.com/arcgisdesktop/9.3/index.cfm?TopicName=An_overview_of_the_Solar_Radiation_tools An example of using the ArcGIS 9.3 tools to make a free on-line solar map is showcased in the City of Boston: http://gis.cityofboston.gov/solarboston/
ECOTECT: Solar Analysis	Square One Research / Autodesk	- tool to calculate and visualize incident solar radiation on windows and buildings - Also calculates solar stress, solar access, and PV array sizing and load matching	Proprietary software	Microsoft Windows	Building level for international locations	- Free trial download - Contact company for pricing	http://www.squ1.com/products/ecotect/features/solar

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Energy-10 v1.8	Sustainable Buildings Industry Council (SBIC)	<ul style="list-style-type: none"> - This program is for building designers to see the tradeoffs in energy use and savings by looking at different construction methods and materials - The new version, 1.8 has a PV module and solar domestic hot water module 	Proprietary software	Microsoft Windows	Building level in the US	Contact company for pricing	http://sbicouncil.org/displaycommon.cfm?an=1&subarticlenbr=112